

APPENDIX C

```
GOALPOS .. SUM(I,A(I)*MODELAA*DT) =E=FINALPOS;
MODE1(ILAST) .. SUM(I,-A(I)*MODELAA*MODELb/(MODELb-
5  MODELa)*(EXP(-MODELa*(T(ILAST)+DT-T(I)))
  -EXP(-MODELa*(T(ILAST)-T(I)))) =E= 0.0;
MODE2(ILAST) .. SUM(I,A(I)*MODELAA*MODELa/(MODELb-
  MODELa)*(EXP(-MODELb*(T(ILAST)+DT-T(I)))
  -EXP(-MODELb*(T(ILAST)-T(I)))) =E= 0.0;
10  DERIV1(J) .. 1000.0*SUM(I,A(I)*T(I)*EXP(ZETA(J)*W(J)*T(I))*
  SIN(WD(J)*T(I))) =E= 0.0 ;
  DERIV2(J) .. 1000.0*SUM(I,A(I)*T(I)*EXP(ZETA(J)*W(J)*T(I))*
  COS(WD(J)*T(I))) =E= 0.0 ;

15  % MODELAA is the mechanical gain of the system, MODELb, and MODELa
  % are the two time constants of the system in radians. One time constant is
  % associated with the L/R rise time of the motor inductance and the other is
  % the mechanical time constant of the rigid system. The A(I) are the voltages %
  which need to be determined. The T(I) are the times for each of the A(I).
20  % DT is the time spacing of the outputs. W(J) are the undamped flexible
  % modes, WD(J) are the damped flexible modes (in radians/s).
```

25